

IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): A power-on detector comprising:

a current generation circuit having a first output terminal and a second output terminal and configured to produce a first current and a second current from the first output terminal and the second output terminal, respectively, the first current and the second current having a low degree of temperature dependency and being substantially equal to each other;

a first load element connected between the first output terminal of the current generation circuit and a first potential supply source;

~~a reference potential generation circuit which generates a reference potential; and~~

a current mirror circuit having a first current path and a second current path, the first current path being connected to the second output terminal of the current generation circuit;

a second load element connected between the second current path of the current mirror circuit and a second potential supply source; and

~~a first comparator which compares a first voltage generated on the basis of the reference potential output from the reference potential generation circuit and a potential of a first potential supply source, and a second voltage generated on the basis of the reference potential and a potential of a second potential supply source different from the potential of the first potential supply source,~~ having a first input terminal connected to the first output terminal of the current generation circuit, and a second input terminal connected to a connection node between the second load element and the current mirror circuit, the first comparator making a comparison between (i) a first voltage obtained by causing the first current output from the first output terminal of the current generation circuit to flow to the first potential supply source by way of the first load element, and (ii) a second voltage

obtained by causing a current flowing from the second potential supply circuit to the second current path of the current mirror circuit by way of the second load element,

wherein power-on is detected when ~~a potential difference between the potentials of the first and second potential supply sources upon power-on becomes larger than a sum of the first and second voltages~~ the second voltage becomes higher than the first voltage when a power supply is turned on.

Claim 2 (Currently Amended): The detector according to claim 1, wherein the ~~reference potential~~ current generation circuit includes a band gap reference circuit.

Claim 3 (Currently Amended): The detector according to claim 2, wherein the band gap reference circuit comprises:

a first circuit unit which is so constituted as to generate a third ~~[[first]]~~ current having a positive temperature characteristic,

a second circuit unit which is so constituted as to generate a fourth ~~second~~ current having a negative temperature characteristic, and

a third circuit unit which is so constituted as to add the third ~~[[first]]~~ current output from the first circuit unit and the fourth ~~second~~ current output from the second circuit unit and to generate the first current and the second current ~~reference potential~~ on the basis of the added ~~current~~ currents.

Claim 4 (Currently Amended): The detector according to claim 3, wherein the first circuit unit comprises:

a second comparator,

a first MOS transistor of a first conductivity type which has one end of a current path connected to the second potential supply source, the other end of the current path connected to a non-inverting input terminal of the second comparator, and a gate connected to an output terminal of the second comparator,

a second MOS transistor of the first conductivity type which has one end of a current path connected to the second potential supply source, the other end of the current path connected to an inverting input terminal of the second comparator, and a gate connected to the output terminal of the second comparator,

a first resistor which has one terminal connected to said other end of the current path of the first MOS transistor,

a first diode which has an anode connected to the other terminal of the first resistor and a cathode connected to the first potential supply source, and

a second diode which has an anode connected to said other end of the current path of the second MOS transistor and a cathode connected to the first potential supply source, and

the first circuit unit obtains an output signal from the output terminal of the second comparator.

Claim 5 (Currently Amended): The detector according to claim 4, wherein the second circuit unit comprises:

a third comparator,

a third MOS transistor of the first conductivity type which has one end of a current path connected to the second potential supply source and the other end of the current path connected to an inverting input terminal of the third comparator and receives at a gate the output signal from the first circuit unit,

a fourth MOS transistor of the first conductivity type which has one end of a current path connected to the second potential supply source, the other end of the current path connected to a non-inverting input terminal of the third comparator, and a gate connected to an output terminal of the third comparator,

a third diode which has an anode connected to said other end of the current path of the third MOS transistor and a cathode connected to the first potential supply source, and

a second resistor which has one terminal connected to said other end of the current path of the fourth MOS transistor and the other terminal connected to the first potential supply source, and

the second circuit unit obtains an output signal from the output terminal of the third comparator.

Claim 6 (Currently Amended): The detector according to claim 5, wherein the third circuit unit comprises:

a fifth MOS transistor of the first conductivity type which has one end of a current path connected to the second potential supply source and the other end of the current path connected to the first output terminal and receives at a gate the output signal from the first circuit unit,

a sixth MOS transistor of the first conductivity type which has one end of a current path connected to the second potential supply source and the other end of the current path connected to ~~said other end of the current path of the fifth MOS transistor~~ the first output terminal and receives at a gate the output signal from the second circuit unit, ~~and a third resistor which has one terminal connected to said other end of each of the current paths of the fifth and sixth MOS transistors and the other terminal connected to the first potential supply~~

~~source, and the third circuit unit outputs the reference potential from a connection node between said other end of each of the current paths of the fifth and sixth MOS transistors and said one terminal of the third resistor~~

a seventh MOS transistor of the first conductivity type which has one end of a current path connected to the second potential supply source and the other end of the current path connected to the second output terminal and receives at a gate the output signal from the first circuit unit, and

an eighth MOS transistor of the first conductivity type which has one end of a current path connected to the second potential supply source and the other end of the current path connected to the second output terminal and receives at a gate the output signal from the second circuit unit.

Claims 7-8 (Canceled).

Claim 9 (Currently Amended): The detector according to claim ~~[[8]]~~ 1, wherein the current mirror circuit comprises:

a ninth ~~seventh~~ MOS transistor of a second conductivity type which has one end of a current path and a gate connected to ~~[[an]]~~ the second output terminal of the current ~~reference~~ ~~potential~~ generation circuit and the other end of the current path connected to the first potential supply source, and

a tenth ~~an eighth~~ MOS transistor of the second conductivity type which has one end of a current path connected to the second load element, the other end of the current path connected to the first potential supply source, and a gate commonly connected to the gate of the ninth ~~seventh~~ MOS transistor.

Claim 10 (Currently Amended): The detector according to claim 1, wherein the first comparator comprises:

an 11th ~~a-ninth~~ MOS transistor of a first conductivity type which has a gate connected to the first ~~an inverting~~ input terminal,

a 12th ~~[[10th]]~~ MOS transistor of the first conductivity type which has one end of a current path commonly connected to said one end of a current path of the 11th ~~[[ninth]]~~ MOS transistor and a gate connected to the second ~~a non-inverting~~ input terminal,

a 13th ~~[[11th]]~~ MOS transistor of the first conductivity type which has one end of a current path connected to ~~[[said]]~~ one end of each of the current paths of the 11th ~~[[ninth]]~~ and 12th ~~[[10th]]~~ MOS transistors and the other end of the current path connected to the second potential supply source,

a 14th ~~[[12th]]~~ MOS transistor of a second conductivity type which has one end of a current path and a gate connected to the other end of the current path of the 11th ~~[[ninth]]~~ MOS transistor and the other end of the current path connected to the first potential supply source,

a 15th ~~[[13th]]~~ MOS transistor of the second conductivity type which has one end of a current path connected to the other end of the current path of the 12th ~~[[10th]]~~ MOS transistor, the other end of the current path connected to the first potential supply source, and a gate commonly connected to the gate of the 14th ~~[[12th]]~~ MOS transistor,

a 16th ~~[[14th]]~~ MOS transistor of the first conductivity type which has one end of a current path connected to the second potential supply source, the other end of the current path connected to the output terminal, and a gate commonly connected to a gate of the 13th ~~[[11th]]~~ MOS transistor, and

a 17th ~~[[15th]]~~ MOS transistor of the second conductivity type which has one end of a current path connected to the output terminal, the other end of the current path connected to the first potential supply source, and a gate connected to a connection node between the current paths of the 12th ~~[[10th]]~~ and 15th ~~[[13th]]~~ MOS transistors.

Claim 11 (Currently Amended): A power-on reset circuit comprising:

a data holding circuit which holds data;

a current generation circuit having a first output terminal and a second output terminal and configured to produce a first current and a second current from the first output terminal and the second output terminal, respectively, the first current and the second current having a low degree of temperature dependency and being substantially equal to each other;

a first load element connected between the first output terminal of the current generation circuit and a first potential supply source;

~~a reference potential circuit which generates a reference potential;~~

a current mirror circuit having a first current path and a second current path, the first current path being connected to the second output terminal of the current generation circuit;

a second load element connected between the second current path of the current mirror circuit and a second potential supply source;

~~a first comparator which compares a first voltage generated on the basis of the reference potential output from the reference potential generation circuit and a potential of a first potential supply source, and a second voltage generated on the basis of the reference potential and a potential of a second potential supply source different from the potential of the first potential supply source~~ having a first input terminal connected to the first output terminal of the current generation circuit, and a second input terminal connected

to a connection node between the second load element and the current mirror circuit, the first comparator making a comparison between (i) a first voltage obtained by causing the first current output from the first output terminal of the current generation circuit to flow to the first potential supply source by way of the first load element, and (ii) a second voltage obtained by causing a current flowing from the second potential supply circuit to the second current path of the current mirror circuit by way of the second load element; and

a reset circuit which resets data held by the data holding circuit on the basis of an output signal from the first comparator,

wherein the reset circuit resets data held by the data holding circuit when a ~~potential difference between the potentials of the first and second potential supply sources upon power-on becomes larger than a sum of the first and second voltages~~ the second voltage becomes higher than the first voltage when a power supply is turned on.

Claim 12 (Original): The circuit according to claim 11, wherein the data holding circuit includes at least one of a register and a latch circuit.

Claim 13 (Currently Amended): The circuit according to claim 11, wherein the ~~reference potential~~ current generation circuit includes a band gap reference circuit.

Claim 14 (Currently Amended): The detector according to claim 13, wherein the band gap reference circuit comprises:

a first circuit unit which is so constituted as to generate a third ~~[[first]]~~ current having a positive temperature characteristic,

a second circuit unit which is so constituted as to generate a fourth ~~second~~ current having a negative temperature characteristic, and

a third circuit unit which is so constituted as to add the third ~~[[first]]~~ current output from the first circuit unit and the fourth ~~second~~ current output from the second circuit unit and to generate the first current and the second current ~~reference potential~~ on the basis of the added ~~current~~ currents.

Claim 15 (Currently Amended): The circuit according to claim 14, wherein the first circuit unit comprises:

a second comparator,

a first MOS transistor of a first conductivity type which has one end of a current path connected to the second potential supply source, the other end of the current path connected to a non-inverting input terminal of the second comparator, and a gate connected to an output terminal of the second comparator,

a second MOS transistor of the first conductivity type which has one end of a current path connected to the second potential supply source, the other end of the current path connected to an inverting input terminal of the second comparator, and a gate connected to the output terminal of the second comparator,

a first resistor which has one terminal connected to said other end of the current path of the first MOS transistor,

a first diode which has an anode connected to the other terminal of the first resistor and a cathode connected to the first potential supply source, and

a second diode which has an anode connected to said other end of the current path of the second MOS transistor and a cathode connected to the first potential supply source, and

the first circuit unit obtains an output signal from the output terminal of the second comparator.

Claim 16 (Currently Amended): The circuit according to claim 15, wherein the second circuit unit comprises:

a third comparator,

a third MOS transistor of the first conductivity type which has one end of a current path connected to the second potential supply source and the other end of the current path connected to an inverting input terminal of the third comparator and receives at a gate the output signal from the first circuit unit,

a fourth MOS transistor of the first conductivity type which has one end of a current path connected to the second potential supply source, the other end of the current path connected to a non-inverting input terminal of the third comparator, and a gate connected to an output terminal of the third comparator,

a third diode which has an anode connected to said other end of the current path of the third MOS transistor and a cathode connected to the first potential supply source, and

a second resistor which has one terminal connected to said other end of the current path of the fourth MOS transistor and the other terminal connected to the first potential supply source, and

the second circuit unit obtains an output signal from the output terminal of the third comparator.

Claim 17 (Currently Amended): The circuit according to claim 16, wherein the third circuit unit comprises:

a fifth MOS transistor of the first conductivity type which has one end of a current path connected to the second potential supply source and the other end of the current path connected to the first output terminal and receives at a gate the output signal from the first circuit unit,

a sixth MOS transistor of the first conductivity type which has one end of a current path connected to the second potential supply source and the other end of the current path connected to the first output terminal ~~said other end of the current path of the fifth MOS transistor~~ and receives at a gate the output signal from the second circuit unit, ~~and a third resistor which has one terminal connected to said other end of each of the current paths of the fifth and sixth MOS transistors and the other terminal connected to the first potential supply source, and the third circuit unit outputs the reference potential from a connection node between said other end of each of the current paths of the fifth and sixth MOS transistors and said one terminal of the third resistor~~

a seventh MOS transistor of the first conductivity type which has one end of a current path connected to the second potential supply source and the other end of the current path connected to the second output terminal and receives at a gate the output signal from the first circuit unit, and

an eighth MOS transistor of the first conductivity type which has one end of a current path connected to the second potential supply source and the other end of the current path connected to the second output terminal and receives at a gate the output signal from the second circuit unit.

Claim 18-19 (Canceled).

Claim 20 (Currently Amended): The circuit according to claim ~~[[19]]~~ 11, wherein the current mirror circuit comprises:

a ~~ninth seventh~~ MOS transistor of a second conductivity type which has one end of a current path and a gate connected to ~~[[an]]~~ the second output terminal of the ~~current reference~~ ~~potential~~ generation circuit and the other end of the current path connected to the first potential supply source, and

a ~~tenth an eighth~~ MOS transistor of the second conductivity type which has one end of a current path connected to the second load element, the other end of the current path connected to the first potential supply source, and a gate commonly connected to the gate of the ~~ninth seventh~~ MOS transistor.

Claim 21 (Currently Amended): The circuit according to claim 11, wherein the first comparator comprises:

an 11th ~~a ninth~~ MOS transistor of a first conductivity type which has a gate connected to the first ~~an inverting~~ input terminal,

a 12th ~~[[10th]]~~ MOS transistor of the first conductivity type which has one end of a current path commonly connected to said one end of a current path of the 11th ~~[[ninth]]~~ MOS transistor and a gate connected to the second ~~a non-inverting~~ input terminal,

a 13th ~~[[11th]]~~ MOS transistor of the first conductivity type which has one end of a current path connected to one end of each of the current paths of the 11th ~~[[ninth]]~~ and 12th ~~[[10th]]~~ MOS transistors and the other end of the current path connected to the second potential supply source,

a 14th ~~[[12th]]~~ MOS transistor of a second conductivity type which has one end of a current path and a gate connected to the other end of the current path of the 11th ~~[[ninth]]~~

MOS transistor and the other end of the current path connected to the first potential supply source,

a 15th [[13th]] MOS transistor of the second conductivity type which has one end of a current path connected to the other end of the current path of the 12th [[10th]] MOS transistor, the other end of the current path connected to the first potential supply source, and a gate commonly connected to the gate of the 14th [[12th]] MOS transistor,

a 16th [[14th]] MOS transistor of the first conductivity type which has one end of a current path connected to the second potential supply source, the other end of the current path connected to the output terminal, and a gate commonly connected to a gate of the 13th [[11th]] MOS transistor, and

a 17th [[15th]] MOS transistor of the second conductivity type which has one end of a current path connected to the output terminal, the other end of the current path connected to the first potential supply source, and a gate connected to a connection node between the current paths of the 12th [[10th]] and 15th [[13th]] MOS transistors.